We claim:

1. A method of discovering target access routers in a mobile Internet environment to enable seamless Internet Protocol (IP) handoff of a mobile terminal between access routers, comprising the steps of:

(1) discovering a local geographical neighborhood by transmitting, from a first access router through the mobile terminal to a second access router, an identifier that identifies the first access router;

(2) sharing access router capability information between the first access router and the second access router based on the identifier transmitted in step (1); and

(3) selecting a target access router for a mobile terminal handoff operation on the basis of the access router capability information shared in step (2).

2. The method of claim 1, wherein step (2) is performed by transmitting an IP packet from the second access router to the first access router, and receiving access router capability information from the first access router in response to the transmitted IP packet.

3. The method of claim 1, wherein in step (3) the target access router is selected also on the basis of the direction of movement of the mobile terminal.

4. The method of claim 1, wherein step (2) is performed by transmitting access router capability information from the second access router to the first access router through the mobile terminal.

5. The method of claim 1, wherein step (3) is performed by the first access router on the basis of capability information stored in the first access router.

6. The method of claim 1, further comprising the step of purging capability information concerning the first access router if no mobile terminal has been handed off from the first access router to the second access router during a certain time interval.

7. The method of claim 1, wherein step (3) is performed by comparing capability requirements of the mobile terminal with access router capability information shared in step (2).

8. The method of claim 3, further comprising the steps of:

(a) detecting a beacon corresponding to the second access router and providing beacon information to the first access router; and

(b) the first access router querying neighbors to determine whether any of the neighbors corresponds to the beacon information provided in step (a).

9. The method of claim 1, wherein step (1) comprises the step of transmitting an IP address of the first access router to the second access router.

10. In a mobile terminal, a method of facilitating a mobile Internet Protocol (IP) handoff from a source access router to one of a plurality of potential target access routers, the method comprising the steps of:

(1) detecting entry into an area served by two or more of the plurality of potential target access routers;

(2) transmitting an address of the source access router from the mobile terminal to one or more of the potential target access routers; and

(3) performing an IP handoff operation from the source access router to one of the plurality of potential target access routers on the basis of capability information received from one or more of the plurality of potential target access routers.

11. The method of claim 10, wherein step (3) is performed in the mobile terminal by selecting a target access router on the basis of bandwidth capabilities required by the mobile terminal.

12. The method of claim 10, wherein step (3) is performed by the source access router on the basis of capability information received by the source access router from the one or more plurality of potential target access routers.

13. The method of claim 10, wherein step (3) comprises the step of performing the IP handoff to one of the plurality of potential target access routers that best matches capabilities required by the mobile terminal.

14. The method of claim 10, wherein step (3) is performed independently of any voice-channel handoff operation that is also supported by the mobile terminal.

15. A method of sharing capability information in a mobile communication network for use in making handoff decisions among access routers, comprising the steps of:

(1) detecting a condition that a mobile terminal presently served by a first access router is entering an area served by a second access router;

(2) transmitting a network address of the first access router from the mobile terminal to the second access router; and

(3) exchanging capability information between the first access router and the second access router, such that each access router learns capabilities of the other access router.

16. The method of claim 15, further comprising the step of:

(4) using the exchanged capability information from step (3) to make a handoff decision for a mobile IP terminal.

17. The method of claim 15, wherein step (3) is performed by transmitting an IP packet from the second access router to the first access router requesting capability information and receiving an IP packet from the first access router containing capability information describing capabilities of the first access router.

18. The method of claim 15, wherein the capability information comprises a bandwidth supported by one of the routers.

19. The method of claim 15, wherein the capability information comprises dynamic loading conditions associated with one of the routers.

20. The method of claim 15, wherein the capability information comprises security schemes supported by one of the routers.

21. The method of claim 15, wherein the capability information comprises the geographic location of one of the access routers.

22. The method of claim 15, wherein the capability information comprises signal transmission technologies supported by a base station associated with one of the access routers.

23. The method of claim 15, wherein the capability information comprises a cost of access using one of the access routers.

24. The method of claim 15,

wherein step (1) comprises the step of detecting a condition that the mobile terminal is entering an area served by at least two potential target access routers;

wherein step (3) comprises the step of exchanging information concerning both of the at least two potential target access routers; and

further including the step of selecting one of at least two potential target access routers on the basis of the capability information exchanged in step (3).

25. The method of claim 15, further comprising the step of:

(4) purging capability information of the first access router if no handoffs from the first access router have been detected within a predetermined time period.

26. The method of claim 16, wherein step (4) comprises the step of selecting an optimum target router on the basis of a predetermined policy.

27. The method of claim 26, wherein the policy specifies that a lowest cost access router should be selected.

28. The method of claim 15, further comprising the step of:

(4) redirecting one or more mobile terminals away from a loaded access router to a less loaded access router on the basis of capability information obtained as a result of step (3).

29. The method of claim 15, wherein step (1) comprises the step of detecting that the mobile terminal is entering an area served by at least two potential target access routers, and further comprising the step of:

(4) selecting one of the two potential target access routers on the basis of a best match between a capability dictated by an application program executing on the mobile terminal and the capabilities of the two potential target access routers.

30. A method of handing off a mobile terminal in a mobile IP network comprising a plurality of access routers each associated with a service area, the method comprising the steps of:

(1) receiving a request to initiate a handoff operation for a mobile terminal in the mobile IP network;

(2) finding an optimal access router to receive the handoff operation for the mobile terminal by evaluating capability information for a plurality of access routers, wherein the capability information was previously obtained by exchanging information among access routers on the basis of information transmitted by one or more mobile terminals in the mobile IP network; and

(3) effecting the handoff operation to the optimal access router.

31. The method of claim 30, wherein step (2) comprises the step of comparing capability requirements associated with the mobile terminal in step (1) with dynamic capability information associated with each of the plurality of access routers.

32. The method of claim 30, wherein step (2) comprises the step of comparing bandwidth requirements of the mobile terminal with bandwidth capabilities of each access router.

33. The method of claim 30, wherein step (2) comprises the step of selecting an access router on the basis of the cost of access.

34. The method of claim 30, wherein step (2) comprises the step of selecting an access router on the basis of a security scheme.

35. A mobile terminal adapted to participate in handoff decisions in a mobile IP network comprising a plurality of access routers, comprising:

a transmit/receive circuit capable of transmitting and receiving digital data within the mobile IP network; and

a mobile IP handoff processing circuit coupled to the transmit/receive circuit, wherein the mobile IP handoff processing circuit transmits a network address of a first access router in the mobile IP network to a second access router in the mobile IP network.

36. The mobile terminal of claim 35, further comprising a capabilities storage area reflecting capabilities needed by the mobile terminal, wherein the mobile IP handoff processing circuit transmits one or more capabilities stored in the capabilities storage area to an access router in the mobile IP network.

37. The mobile terminal of claim 35, wherein the mobile IP processing circuit transmits a bandwidth requirement that is dependent on an application that is presently executing on the mobile terminal.

38. The mobile terminal of claim 35, further comprising a signal strength detector coupled to the transmit/receive circuit and to the mobile IP handoff processing circuit, wherein the mobile IP handoff processing circuit in response to detecting that signal strength has dropped below a threshold, initiates a handoff process within the mobile IP network.

39. An access router for use in a mobile IP network having a plurality of access routers each of which routes IP packets among mobile terminals in a service area, comprising a processor that executes computer-readable instructions for performing the steps of:

(1) receiving from a mobile terminal a network address of another access router in communication with the mobile terminal;

(2) storing the network address into a capabilities map that defines capabilities of geographically proximate access routers; and

(3) using the stored network address to make a handoff decision concerning a second mobile terminal in the mobile IP network.

40. The access router of claim 39, wherein the processor further executes computer-readable instructions that perform the step of:

(4) exchanging capabilities information with the another access router, such that the access router and the another access router become aware of the others' capabilities on the basis of the network address received from the mobile terminal.

41. The access router of claim 40, wherein the processor executes computer-readable instructions that exchange bandwidth capacity information between the access router and the another access router, wherein the instructions in step (3) select an access router on the basis of the bandwidth capacity information.

42. The access router of claim 40, wherein the processor executes computer-readable instructions that exchange dynamic loading information between the access router and the another access router, wherein the instructions in step (3) select an access router on the basis of the dynamic loading information.

43. The access router of claim 40, wherein the processor executes computer-readable instructions that make a handoff decision concerning a second mobile terminal in the mobile IP network on the basis of a policy stored in the access router.

44. The access router of claim 43, wherein the policy results in selection of an access router on the basis of access cost.

45. The access router of claim 40, wherein the processor executes computer-readable instructions that make a handoff decision by comparing capability requirements received from a second mobile terminal with capability information previously obtained in step (4).

46. A system comprising a plurality of access routers in a mobile IP network, wherein each access router comprises computer-executable instructions that, when executed, perform the steps of:

(1) receiving from a first mobile terminal an IP address associated with another access router in the mobile IP network;

(2) using the IP address associated with the other access router to discover capabilities of the other access router;

(3) storing capabilities of the other access router in a capabilities map that maps each of a plurality of access routers to capabilities associated with each access router; and

(4) in response to a request to perform a handoff of an IP service involving a second mobile terminal, finding an optimum access router to effect the handoff on the basis of the previously stored capabilities map.

47. The system of claim 46, wherein each access router comprises computer-executable instructions that perform the step of comparing capabilities requirements received from the second mobile terminal with the capabilities map.

48. The system of claim 46, wherein each access router comprises computer-executable instructions that perform the step of finding an optimum access router by comparing the previously stored capabilities map with a policy.

49. The method of claim 1, further comprising the step of, after step (1), validating that the first access router recently served the mobile terminal and, if the first access router did not recently serve the mobile terminal, inhibiting the sharing of capability information in step (2).

50. The method of claim 49, wherein the step of validating comprises the step of transmitting an IP packet from the second access router to the first access router and

receiving a response from the first access router confirming that the mobile terminal was recently served by the first access router.

51. The method of claim 1, wherein step (2) comprises the step of sharing information concerning an access point associated with the second access router.